independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

The dotted line indicates the presence of either a single or double bond;

E is NR7;

G is  $OR^7$ .

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In another sub-embodiment, a structure of the formula (IX) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

The dotted line indicates the presence of either a single or double bond;

E is  $NR^7$ ;

G is  $NR^7R^8$ .

In another sub-embodiment, a structure of the formula (IX) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^{1}$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^{7}$  (X = O,  $NR^{8}$  or S);

5

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>1</sup> and R<sup>2</sup>, R<sup>7</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>5</sup>, CR<sup>7</sup>=CR<sup>5</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

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The dotted line indicates the presence of either a single or double bond;

E is NR7;

G is  $SR^7$ .

In a particular embodiment of the present invention, the compounds of the formula

(IX) are the following species:

	R	E.T			(IX	)	
G	E	Ri	R <sup>z</sup>	R	R*	$\mathbb{R}^{5}$	$\mathbb{R}^{n}$
OH	0	Me	H	H	H	Me	Me
OH	0	î-Pr	H	H	H	Me	Me

$ \begin{array}{c} R^1 \\ R^5 \\ R^2 \end{array} $ $ \begin{array}{c} R^6 \\ R^5 \\ R^4 \end{array} $									
	$R^3$ (IX)								
G	E	R	R <sup>2</sup>	₽,	R³	R	R		
OH	O	Ph	H	H	H	Me	Me		
OH	Ō	Me	Me	H	H	Me	Me		
OH	Ö	i-Pr	Me	H	H	Me	Me		
OH	0	Ph	Me	H	H	Me	Me		
OH	0	Me	H	Me	H	Me	Me		
OH	0	į-Pr	H	Me	H	Me	Me		
OH	0	Ph	H	Me	H	Me	Me		
OH	0	Me	Ħ	H	Me	Me	Me		
OH	0	i-Pr	H	H	Me	Me	Me		
OH	O	Ph	Ħ	H	Me	Me	Me		
OH	0	Me	H	CH <sub>2</sub> Ph	H	Me	Me		
OH	0	i-Pr	H	CH <sub>2</sub> Ph	H	Me	Me		
OH	0	Ph	Н	CH <sub>2</sub> Ph	H	Me	Me		
OH	CH <sub>2</sub>	Me	H	H	H	Me	Ме		
OH	CH <sub>2</sub>	<i>i-</i> Pr	Ħ	H	H	Me	Me		
OH	CH <sub>2</sub>	Ph	H	H	Ħ	Me	Me		
OH	CH <sub>2</sub>	Me	Me	H	H	Me	Me		
OH	CH <sub>2</sub>	i-Pr	Me	H	H	Me	Me		
OH	CH <sub>2</sub>	Ph	Me	H	H	Me	Me		

	$ \begin{array}{c c} R^1 & & & \\ R^2 & & & \\ R^3 & & & \\ \end{array} $ (IX)										
G	E	$\mathbf{R}_1$	R <sup>2</sup>	183	R*	$\mathbb{R}^{5}$	R				
OH	CH <sub>2</sub>	Me	H	Me	Ħ	Me	Me				
OH	CH <sub>2</sub>	i-Pr	H	Me	Ħ	Me	Me				
OH	CH <sub>2</sub>	Ph	H	Me	H	Me	Me				
OH	CH <sub>2</sub>	Me	H	H	Me	Me	Me				
OH	CH <sub>2</sub>	i-Pr	H	H	Me	Me	Me				
OH	CH <sub>2</sub>	Ph	H	H	Me	Me	Me				
OH	CH <sub>2</sub>	Me	H	CH <sub>2</sub> Ph	H	Me	Me				
OH	CH <sub>2</sub>	i-Pr	H	CH <sub>2</sub> Ph	H	Me	Me				
OH	CH <sub>2</sub>	Ph	H	CH <sub>2</sub> Ph	H	Me	Me				

In a sub-embodiment, a structure of the formula (X) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

5 A is 0;

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>13</sup> (X = O, NR<sup>14</sup> or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup>, R<sup>18</sup>, R<sup>19</sup>, R<sup>20</sup>, R<sup>21</sup>, R<sup>22</sup> and R<sup>23</sup> independently are selected from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic,

sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^{11}$  (X = O,  $NR^{12}$  or S);

5

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>13</sup>R<sup>14</sup> groups, connected by a tether, independently selected from CR<sup>15</sup>R<sup>16</sup>, CR<sup>15</sup>R<sup>16</sup>CR<sup>17</sup>R<sup>18</sup>, CR<sup>13</sup>=CR<sup>16</sup>, CR<sup>15</sup>R<sup>16</sup>O or CR<sup>15</sup>R<sup>16</sup>NR<sup>17</sup>;

the dotted line indicates the presence of either a single or double bond, wherein in the presence of a single bond, the valences are completed with hydrogens.

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In another sub-embodiment, a structure of the formula (X) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

A is  $NR^7$ ;

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^{13}$  (X = O,  $NR^{14}$  or S);

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R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup>, R<sup>18</sup>, R<sup>19</sup>, R<sup>20</sup>, R<sup>21</sup>, R<sup>22</sup> and R<sup>23</sup> independently are selected from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>11</sup> (X = O, NR<sup>12</sup> or S);

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>13</sup>R<sup>14</sup> groups, connected by a tether, independently selected from CR<sup>15</sup>R<sup>16</sup>, CR<sup>15</sup>R<sup>16</sup>CR<sup>15</sup>R<sup>18</sup>, CR<sup>15</sup>=CR<sup>16</sup>, CR<sup>15</sup>R<sup>16</sup>O or CR<sup>15</sup>R<sup>16</sup>NR<sup>17</sup>;

the dotted line indicates the presence of either a single or double bond, wherein in the presence of a single bond, the valences are completed with hydrogens.

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In another sub-embodiment, a structure of the formula (X) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

A is S;

S

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R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>13</sup> (X = O, NR<sup>14</sup> or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup>, R<sup>18</sup>, R<sup>19</sup>, R<sup>20</sup>, R<sup>21</sup>, R<sup>22</sup> and R<sup>23</sup> independently are selected from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>11</sup> (X = O, NR<sup>12</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>13</sup>R<sup>14</sup> groups, connected by a tether, independently selected from CR<sup>15</sup>R<sup>16</sup>, CR<sup>15</sup>R<sup>16</sup>CR<sup>17</sup>R<sup>18</sup>, CR<sup>15</sup>=CR<sup>16</sup>, CR<sup>15</sup>R<sup>16</sup>O or CR<sup>15</sup>R<sup>16</sup>NR<sup>17</sup>;

the dotted line indicates the presence of either a single or double bond, wherein in the presence of a single bond, the valences are completed with hydrogens.

In a sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester,

alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>5</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>.

The dotted line indicates the presence of either a single or double bond;

E is selected from the groups that include  $CR^7R^8$ , O, S or  $NR^7$ ;

A is selected from the groups that include O, NR7 or S.

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In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S).

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

20

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>6</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>; and

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The dotted line indicates the presence of either a single or double bond;

E is O:

A is O.

In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

S

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

10

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfanonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S).

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 $R_1$  and  $R_2$ ,  $R_2$  and  $R_3$ ,  $R_3$  and  $R_4$ ,  $R_4$  and  $R_5$  and  $R_5$  and  $R_6$  can also each be comprised of one or two  $CR_7R_8$  groups, connected by a tether, selected independently from groups that include  $CR_7R_8$ ,  $CR_7R_8CR_7R_8$ ,  $CR_7=CR_8$ ,  $CR_7R_8O$  and  $CR_7R_8NR_7$ .

The dotted line indicates the presence of either a single or double bond;

E is O;

20 A is  $NR^7$ .

In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

25

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl,

heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = 0, NR<sup>8</sup> or S);

5

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>; and

The dotted line indicates the presence of either a single or double bond;

10

E is O;

A is S.

In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

15

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

20

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfanonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

25

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>.

The dotted line indicates the presence of either a single or double bond;

E is CR<sup>7</sup>R<sup>8</sup>;

A is O.

In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

5

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

10

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

15

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sub>7</sub>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>; and

The dotted line indicates the presence of either a single or double bond;

20

E is CR<sup>7</sup>R<sup>8</sup>;

A is  $NR^7$ .

In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

The dotted line indicates the presence of either a single or double bond;

E is CR<sup>7</sup>R<sup>8</sup>;

A is S.

In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = 0,  $NR^8$  or S);

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>;

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The dotted line indicates the presence of either a single or double bond;

B is S:

A is O.

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In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

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The dotted line indicates the presence of either a single or double bond;

E is S;

A is  $NR^7$ .

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In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide,

a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

The dotted line indicates the presence of either a single or double bond;

E is S;

A is S.

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In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected

independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>:

The dotted line indicates the presence of either a single or double bond;

E is  $NR^7$ ;

A is O.

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In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>6</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfanonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

The dotted line indicates the presence of either a single or double bond;

E is NR7;

A is NR<sup>8</sup>.

In another sub-embodiment, a structure of the formula (XI) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

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The dotted line indicates the presence of either a single or double bond;

E is NR?;

A is S.

In a particular embodiment of the present invention, the compounds of the formula (XI) are the following species:

		R <sup>1</sup> E	R° F	,5 ,4			
A	E		k <sup>3</sup>	R,	(X	I) R <sup>2</sup>	R
0	O	Me	H	H	H	Me	Me
0	0	í-Pr	Ħ	Ħ	H	Me	Me

$R^1$ $R^5$ $R^5$ $R^2$									
	0								
A	E	R	R <sup>2</sup>	183	R*	R <sup>s</sup>	R		
O	Ō	Ph	H	H	Ħ	Me	Me		
O	0	Me	Me	H	H	Me	Me		
O	0	i-Pr	Me	H	Ħ	Me	Me		
O	0	Ph	Me	H	H	Me	Me		
0	O	Me	H	Me	H	Me	Me		
Ö	0	i-Pr	H	Me	H	Me	Me		
O	O	Ph	H	Me	H	Me	Me		
O	Ō	Me	H	H	Me	Me	Me		
O	Ö	í-Pr	H	H	Me	Me	Me		
Ō	O	Ph	H	H	Me	Me	Me		
Ö	0	Me	H	CH <sub>2</sub> Ph	H	Me	Me		
O	0	í-Pr	H	CH <sub>2</sub> Ph	H	Me	Me		
Ō	0	Ph	H	CH <sub>2</sub> Ph	H	Me	Me		
0	CH <sub>2</sub>	Me	H	H	H	Me	Me		
O	CH <sub>2</sub>	i-Pr	H	H	H	Me	Me		
0	CH <sub>2</sub>	Ph	H	H	H	Me	Me		
Ō	CH <sub>2</sub>	Me	Me	H	H	Me	Me		
Ō	CH <sub>2</sub>	i-Pr	Me	H	H	Me	Me		
o	CH <sub>2</sub>	Ph	Me	H	H	Me	Me		

	$ \begin{array}{c c} R^1 & R^6 \\ E & R^5 \\ R^2 & R^4 \\ \end{array} $ (XI)										
A	E	R'	R²	R <sup>3</sup>	R*	R <sup>5</sup>	R				
0	CH <sub>2</sub>	Me	H	Me	H	Me	Me				
0	CH <sub>2</sub>	i-Pr	H	Me	H	Me	Me				
0	CH <sub>2</sub>	Ph	H	Me	H	Me	Me				
O	CH <sub>2</sub>	Me	H	H	Me	Me	Me				
Ō	CH <sub>2</sub>	i-Pr	H	H	Me	Me	Me				
O	CH <sub>2</sub>	Ph	H	H	Me	Me	Me				
O	CH <sub>2</sub>	Me	H	CH <sub>2</sub> Ph	H	Me	Me				
Ö	CH <sub>2</sub>	i-Pr	H	CH <sub>2</sub> Ph	H	Me	Me				
Ö	CH <sub>2</sub>	Ph	H	CH <sub>2</sub> Ph	Ħ	Me	Me				

In a sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

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 $R^{1}$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^{7}$  (X = O,  $NR^{8}$  or S).

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester,

alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

 $R_1$  and  $R_2$ ,  $R_2$  and  $R_3$ ,  $R_3$  and  $R_4$ ,  $R_4$  and  $R_5$  and  $R_5$  and  $R_6$  can also each be comprised of one or two  $CR_7R_8$  groups, connected by a tether, selected independently from groups that include  $CR_7R_8$ ,  $CR_7R_8CR_7R_8$ ,  $CR_7=CR_8$ ,  $CR_7R_8O$  and  $CR_7R_8NR_7$ .

E and D are selected from the groups that include  $CR^7R^8$ , O, S or  $NR^7$ ;

A is selected from the groups that include O, NR7 or S.

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = 0,  $NR^8$  or S).

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>; and

D = 0, E = 0 and A = 0.

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = 0,  $NR^8$  or S).

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R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>5</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>.

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D = 0,  $E = NR^8$  and A = 0.

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected

independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>; and

$$D = O$$
,  $E = CR^7R^8$ , and  $A = O$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = 0,  $NR^8$  or S).

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>.

$$D = O$$
,  $E = S$  and  $A = O$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylafkyl,

heterocyclic, sulfonyl, sulfanyl, sulfinyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

S

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sub>7</sub>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>; and

D = 0, E = 0 and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, eycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

D = 0,  $E = NR^8$  and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

S

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>;

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D = O,  $E = CR^7R^8$  and  $A = NR^7$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = 0, NR<sup>8</sup> or S);

 $R_1$  and  $R_2$ ,  $R_2$  and  $R_3$ ,  $R_3$  and  $R_4$ ,  $R_4$  and  $R_5$  and  $R_5$  and  $R_6$  can also each be comprised of one or two  $CR_7R_8$  groups, connected by a tether, selected

independently from groups that include CR7R8, CR7R8CR7R8, CR7=CR8, CR7R8O and CR7R8NR7;

$$D = O$$
,  $E = S$  and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfamyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

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$$D = CR^7R^8$$
,  $E = 0$  and  $A = 0$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

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R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylaikyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = 0, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>:

 $D = CR^7R^8$ ,  $E = NR^8$  and A = O.

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>6</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = CR^7R^8$ ,  $E = CR^7R^8$  and A = O.

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylaikyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = CR^7R^8$ , E = S, and A = O.

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>6</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = CR^7R^8$ , E = O and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = CR^7R^8$ ,  $E = NR^8$  and  $A = NR^7$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^{1}$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^{7}$  (X = O,  $NR^{8}$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>9</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = CR^7R^8$ ,  $E = CR^7R^8$  and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = CR^7R^8$ , E = S and  $A = NR^7$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^6$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylaikyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

D = S, E = O and A = O.

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>3</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = S, E = NR^8$  and A = O.

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = S_s E = CR^7R^8$  and A = O.

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

D = S, E = S, and A = O.

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^{1}$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^{7}$  (X = O,  $NR^{8}$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfanonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>7</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>6</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

D = S, E = O and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cyclosikyl, cyclosikenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>:

D = S,  $E = NR^8$  and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

5 D = S,  $E = CR^7R^8$  and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

D = S, E = S and  $A = NR^7$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7$ , E = O and A = O.

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>≈CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7$ ,  $E = NR^8$  and A = 0.

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7$ ,  $E = CR^7R^8$  and A = O.

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7, E = S, \text{ and } A = O.$ 

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7$ , E = O and  $A = NR^7$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or produce are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylaikyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7$ ,  $E = NR^8$  and  $A = NR^7$ .

In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7$ ,  $E = CR^7R^8$  and  $A = NR^7$ .

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In another sub-embodiment, a structure of the formula (XII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug are defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkeryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>5</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

 $D = NR^7$ , E = S and  $A = NR^7$ .

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In a particular embodiment of the present invention, the compounds of the formula (XII) are the following species:

	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$											
A	D	E	R	R <sup>2</sup>	R		$R_{z}$	R				
0	Ö	0	Me	H	H	H	Me	Me				
ō	O	0	<i>i</i> -Pr	H	H	H	Me	Me				
0	0	0	Ph	H	H	H	Me	Me				

		R <sub>1</sub>		} <sup>6</sup> `R <sup>5</sup>				
		$\mathbb{R}^{2^{-2}}$	N <sub>3</sub> D	(XXI)				
A	D	E	R'	R <sup>2</sup>	R <sup>3</sup>	R*	$\mathbb{R}^3$	R
0	O	O	Me	Me	H	H	Me	Me
ō	0	0	i-Pr	Me	H	H	Me	Me
0	O	0	Ph	Me	H	H	Me	Me
0	Ō	0	Me	H	Me	H	Me	Me
O	0	0	i-Pr	H	Me	H	Me	Me
0	0	Ō	Ph	H	Me	H	Me	Me
0	0	0	Me	H	Ħ	Me	Ме	Me
0	0	O	i-Pr	H	H	Me	Me	Me
0	0	0	Ph	H	H	Me	Me	Me
0	O	0	Me	H	CH₂Ph	H	Me	Me
0	0	0	/-Pr	H	CH <sub>2</sub> Ph	H	Ме	Me
0	Ō	Ö	Ph	Ħ	CH <sub>2</sub> Ph	Ħ	Me	Me
0	0	CH <sub>2</sub>	Me	H	Н	H	Me	Me
O	Ō	CH <sub>2</sub>	7-Pr	Ħ	H	H	Me	Me
O	Ö	CH <sub>2</sub>	Ph	Ħ	H	H	Me	Me
O	Ō	CH <sub>2</sub>	Me	Me	H	H	Me	Me
ō	0	CH <sub>2</sub>	i-Pr	Me	II	H	Me	Me
O	0	CH <sub>2</sub>	Ph	Me	H	H	Me	Me
Ō	0	CH <sub>2</sub>	Me	H	Me	H	Me	Me

	R <sup>1</sup> R <sup>6</sup>											
		$\frac{E}{R^2}$		`R <sup>5</sup> `R <sup>4</sup>								
		2.%	R <sup>3</sup> D		(XII)							
A	D	10.	R'	R <sup>2</sup>	R	R	Ka	R				
0	O	CH <sub>2</sub>	i-Pr	H	Me	Ħ.	Me	Me				
0	Ö	CH <sub>2</sub>	Ph	H	Me	H	Me	Me				
ō	0	CH <sub>2</sub>	Me	H	Ħ	Me	Me	Me				
O	Ö	CH <sub>2</sub>	i-Pr	Н	Ħ	Me	Me	Me				
ō	0	CH <sub>2</sub>	Ph	H	H	Me	Me	Me				
ō	Ö	CH <sub>2</sub>	Me	H	CH <sub>2</sub> Ph	H	Me	Mc				
O	Ō	CH <sub>2</sub>	i-Pr	H	CH <sub>2</sub> Ph	Ħ	Me	Me				
O	CH <sub>2</sub>	CH <sub>2</sub>	Ph	H	CH <sub>2</sub> Ph	H	Me	Me				
O	CH <sub>2</sub>	CH <sub>2</sub>	Me	H	II	H	Me	Me				
Ō	CH <sub>2</sub>	CH <sub>2</sub>	7-Pr	H	H	H	Me	Me				
O	CH <sub>2</sub>	CH <sub>2</sub>	Ph	H	H	H	Me	Me				
0	CH <sub>2</sub>	CH <sub>2</sub>	Me	Me	H	H	Me	Me				
O	CH <sub>2</sub>	CH <sub>2</sub>	i-Pr	Me	H	H	Me	Me				
Ö	CH <sub>2</sub>	CH <sub>2</sub>	Ph	Me	H	H	Me	Me				
0	CH <sub>2</sub>	CH <sub>2</sub>	Me	H	Me	H	Me	Me				
Ö	CH <sub>2</sub>	CH <sub>2</sub>	i-Pr	H	Me	H	Me	Me				
O	CH <sub>2</sub>	CH <sub>2</sub>	Ph	H	Me	H	Me	Me				
O	CH <sub>2</sub>	CH <sub>2</sub>	Me	H	H	Me	Me	Me				
0	CH <sub>2</sub>	CH <sub>2</sub>	i-Pr	H	H	Me	Me	Me				

***************************************		$R^{1} > E$ $E^{2} > R^{2}$	A A A A A A A A A A A A A A A A A A A	R <sup>6</sup> R <sup>5</sup> R <sup>4</sup>		(XII)		
A	D	<b>X</b>	R,	R <sup>2</sup>	R <sup>3</sup>	R	R <sup>5</sup>	R
Ō	CH <sub>2</sub>	CH <sub>2</sub>	Ph	H	H	Me	Me	Me
ō	CH <sub>2</sub>	CH <sub>2</sub>	Me	H	CH <sub>2</sub> Ph	H	Me	Me
O	CH <sub>2</sub>	CH <sub>2</sub>	i-Pr	H	CH <sub>2</sub> Ph	H	Me	Me
0	CH <sub>2</sub>	CH <sub>2</sub>	Ph	H	CH <sub>2</sub> Ph	H	Me	Me

In a sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>6</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>.

The dotted line indicates the presence of either a single or double bond;

D is selected from the groups that include  $CR^7R^8$ , O, S or  $NR^7$ ;

A is selected from the groups that include O, NR7 or S.

In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S).

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R_1$  and  $R_2$ ,  $R_2$  and  $R_3$ ,  $R_3$  and  $R_4$ ,  $R_4$  and  $R_5$  and  $R_5$  and  $R_6$  can also each be comprised of one or two  $CR_7R_8$  groups, connected by a tether, selected independently from groups that include  $CR_7R_8$ ,  $CR_7R_8CR_7R_8$ ,  $CR_7=CR_8$ ,  $CR_7R_8$ O and  $CR_7R_8NR_7$ ; and

The dotted line indicates the presence of either a single or double bond;

D is O;

S

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A is O.

In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S).

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>.

The dotted line indicates the presence of either a single or double bond;

D is O;

A is  $NR^7$ .

In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S).

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>; and

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The dotted line indicates the presence of either a single or double bond;

D is O;

A is S.

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In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = 0, NR<sup>8</sup> or S).

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>2</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>.

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The dotted line indicates the presence of either a single or double bond;

D is CR<sup>7</sup>R<sup>8</sup>;

A 0.

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In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sub>7</sub>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>; and

The dotted line indicates the presence of either a single or double bond;

D is CR<sup>7</sup>R<sup>8</sup>;

A is  $NR^7$ .

In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

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The dotted line indicates the presence of either a single or double bond;

D is CR7R8;

A is S.

S

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In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = 0,  $NR^8$  or S);

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>;

The dotted line indicates the presence of either a single or double bond;

D is S;

A is O.

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In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide,

a residue of a natural or synthetic amino acid, or carbobydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylaikyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>6</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

The dotted line indicates the presence of either a single or double bond;

D is S;

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A is NR7.

In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfinyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected

independently from groups that include CR7R8, CR7R8CR7R8, CR7=CR8, CR7R8O and CR7R8NR7;

The dotted line indicates the presence of either a single or double bond;

D is S;

A is S.

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In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkeryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = 0, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>:

The dotted line indicates the presence of either a single or double bond;

D is NR7;

A is O.

In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

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The dotted line indicates the presence of either a single or double bond;

D is NR7;

A is NR8.

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In another sub-embodiment, a structure of the formula (XIII) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

5 The dotted line indicates the presence of either a single or double bond;

D is  $NR^7$ ;

A is S.

In a particular embodiment of the present invention, the compounds of the formula

(XIII) are the following species:

$ \begin{array}{c c} R^1 & R^6 \\ R^2 & R^5 \\ R^2 & R^4 \end{array} $ (XIII)										
À	D	R	R <sup>z</sup>	R	R	R <sup>5</sup>	R			
0	Ö	Me	H	H	H	Me	Me			
0	Ö	i-Pr	H	H	H	Me	Me			
0	0	Ph	H	H	H	Me	Me			
O	0	Me	Me	H	H	Me	Me			
O	Ö	<i>i</i> -Pr	Me	Ħ	H	Me	Me			
O	0	Ph	Me	H	H	Me	Me			
O	0	Me	H	Me	H	Me	Me			
O.	0	/-Pr	H	Me	H	Me	Me			
O	0	Ph	H	Me	H	Me	Me			
Ö	0	Me	Ħ	H	Me	Me	Me			

R $R$ $R$ $R$										
	R	2 R	$\begin{cases} \uparrow \\ 3 \end{cases} D$ R	4	(XII	II)				
A	D	R'	$\mathbb{R}^{r}$	R.	R <sup>3</sup>	R	R"			
Ō	Ō	i-Pr	Н	H	Me	Me	Me			
0	O	Ph	H	H	Me	Me	Me			
O	0	Me	Ħ	CH <sub>2</sub> Ph	H	Mc	Me			
Ō	Ō	<i>i-</i> Pr	H	CH <sub>2</sub> Ph	H	Me	Me			
Ö	Ō	Ph	H	CH <sub>2</sub> Ph	H	Me	Ме			
Ō	CH <sub>2</sub>	Me	H	H	H	Me	Me			
0	CH <sub>2</sub>	i-Pr	H	H	H	Me	Me			
0	CH <sub>2</sub>	Ph	H	H	H	Me	Me			
0	CH <sub>2</sub>	Me	Me	H	H	Me	Me			
0	CH <sub>2</sub>	i-Pr	Me	H	H	Me	Ме			
O	CH <sub>2</sub>	Ph	Me	H	H	Me	Me			
0	CH <sub>2</sub>	Me	H	Me	H	Ме	Me			
0	CH <sub>2</sub>	i-Pr	H	Me	H	Me	Me			
ō	CH <sub>2</sub>	Ph	H	Me	H	Me	Me			
Ō	CH <sub>2</sub>	Me	H	H	Me	Me	Me			
0	CH <sub>2</sub>	i-Pr	H	H	Me	Me	Me			
ō	CH <sub>2</sub>	Ph	H	H	Me	Me	Me			
O	CH <sub>2</sub>	Me	H	CH <sub>2</sub> Ph	H	Me	Me			
0	CH <sub>2</sub>	i-Pr	H	CH <sub>2</sub> Ph	H	Me	Me			

***************************************	R	2. <del>\</del>	R <sup>6</sup>	i d	(X)	II)	
A	D	R,	R <sup>2</sup>	K3	18.4	$\mathbb{R}^3$	R
0	CH <sub>2</sub>	Ph	H	CH <sub>2</sub> Ph	H	Me	Me

In a sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

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 $\mathbb{R}^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $X\mathbb{R}^7$  (X=0,  $N\mathbb{R}^8$  or S).

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfanonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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 $R_1$  and  $R_2$ ,  $R_2$  and  $R_3$ ,  $R_3$  and  $R_4$ ,  $R_4$  and  $R_5$  and  $R_5$  and  $R_6$  can also each be comprised of one or two  $CR_7R_8$  groups, connected by a tether, selected independently from groups that include  $CR_7R_8$ ,  $CR_7R_8CR_7R_8$ ,  $CR_7=CR_8$ ,  $CR_7R_8O$  and  $CR_7R_8NR_7$ .

the dotted line indicates the presence of either a single or double bond;

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B is selected from the groups that include CR<sup>7</sup>R<sup>8</sup>, O, S or NR<sup>7</sup>;

G is selected from the groups that include OR7, NR7R8 or SR7.

In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^{T}$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^{7}$  (X = O,  $NR^{8}$  or S).

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, axide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>6</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>5</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>; and

the dotted line indicates the presence of either a single or double bond;

B is O;

G is OR7.

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In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S).

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfinyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester,

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alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>4</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>.

the dotted line indicates the presence of either a single or double bond;

B is O:

G is NR<sup>7</sup>R<sup>8</sup>.

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In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S).

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>5</sup>NR<sup>7</sup>; and

the dotted line indicates the presence of either a single or double bond;

B is O:

G is SR7.

In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$  and  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S).

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R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>.

the dotted line indicates the presence of either a single or double bond;

B is CR<sup>7</sup>R<sup>8</sup>;

 $GOR^7$ .

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In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkearbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro,

cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sub>7</sub>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>; and

the dotted line indicates the presence of either a single or double bond;

B is CR<sup>7</sup>R<sup>8</sup>;

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G is NR<sup>7</sup>R<sup>8</sup>.

In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

R<sup>1</sup> is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

 $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$  are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

R<sup>1</sup> and R<sup>2</sup>, R<sup>2</sup> and R<sup>3</sup>, R<sup>3</sup> and R<sup>4</sup>, R<sup>4</sup> and R<sup>5</sup> and R<sup>5</sup> and R<sup>6</sup> can also each be comprised of one or two CR<sup>7</sup>R<sup>8</sup> groups, connected by a tether, selected independently from groups that include CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>CR<sup>7</sup>R<sup>8</sup>, CR<sup>7</sup>=CR<sup>8</sup>, CR<sup>7</sup>R<sup>8</sup>O and CR<sup>7</sup>R<sup>8</sup>NR<sup>7</sup>;

the dotted line indicates the presence of either a single or double bond;

B is  $CR^7R^8$ ;

G is  $SR^7$ .

In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);

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R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> are selected independently from the groups that include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, arylalkyl, heterocyclic, sulfonyl, sulfanyl, sulfanyl, sulfamonyl, carboxylic acid, amide, nitro, cyano, azide, phosphonyl, phosphinyl, phosphoryl, phosphine, carbamate, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or XR<sup>7</sup> (X = O, NR<sup>8</sup> or S);

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R<sub>1</sub> and R<sub>2</sub>, R<sub>2</sub> and R<sub>3</sub>, R<sub>3</sub> and R<sub>4</sub>, R<sub>4</sub> and R<sub>5</sub> and R<sub>5</sub> and R<sub>6</sub> can also each be comprised of one or two CR<sub>7</sub>R<sub>8</sub> groups, connected by a tether, selected independently from groups that include CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>CR<sub>7</sub>R<sub>8</sub>, CR<sub>7</sub>=CR<sub>8</sub>, CR<sub>7</sub>R<sub>8</sub>O and CR<sub>7</sub>R<sub>8</sub>NR<sub>7</sub>;

the dotted line indicates the presence of either a single or double bond;

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B is 8;

G is  $OR^7$ .

In another sub-embodiment, a structure of the formula (XIV) is given wherein the compound or its pharmaceutically acceptable salts or prodrug is defined as follows:

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 $R^1$  is selected independently from the groups that include hydrogen, alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, heterocyclic, ester, alkcarbonyl, carbonyl, halide, a residue of a natural or synthetic amino acid, or carbohydrate or  $XR^7$  (X = O,  $NR^8$  or S);